



SEQUENCE LISTING

<110> LEMICHEZ, EMMANUEL
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ANJUERE, FABIENNE
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MUNRO, PATRICK
FLATAU, GILLES

<120> A VACCINE COMPOSITION COMPRISING AN IMMUNOADJUVANT
COMPOUND CONSISTING OF A RHO GTPASE FAMILY ACTIVATOR

<130> 0510-1145

<140> 10/589,505
<141> 2006-08-15

<150> PCT/EP05/002105
<151> 2005-02-25

<150> EP 04300100.7
<151> 2004-02-26

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<170> PatentIn Ver. 3.3

<210> 1
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<212> PRT
<213> Escherichia coli

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35 40 45

Asn Ala Tyr Phe Ile Cys Phe Ser Gln Asn Arg Ser Asn Ser Arg Ser
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Glu Val Leu Thr
65 70 75 80

Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr Arg Phe Asp Val Phe
85 90 95

Asp Asp Ala Asn Ser Ser Thr Gly Ile Tyr Lys Thr Lys Ser Ala Asp
100 105 110

Val Phe Asn Glu Glu Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu
115 120 125

His Phe Leu Gln Lys Cys Asp Phe Ala Gly Val Tyr Gly Lys Thr Leu
 130 135 140

Ser Asp Tyr Trp Ser Lys Tyr Tyr Asp Lys Phe Lys Leu Leu Leu Lys
 145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Leu Tyr Leu Tyr Lys Asn Gly Glu Leu
 165 170 175

Asp Glu Arg Glu Tyr Asn Phe Ser Met Asn Ala Leu Asn Arg Ser Asp
 180 185 190

Asn Ile Ser Leu Leu Phe Phe Asp Ile Tyr Gly Tyr Tyr Ala Ser Asp
 195 200 205

Ile Phe Val Ala Lys Asn Asn Asp Lys Val Met Leu Phe Ile Pro Gly
 210 215 220

Ala Lys Lys Pro Phe Leu Phe Lys Lys Asn Ile Ala Asp Leu Arg Leu
 225 230 235 240

Thr Leu Lys Glu Leu Ile Lys Asp Ser Asp Lys Gln Gln Leu Leu Ser
 245 250 255

Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Val Ser Tyr Ala Gly
 260 265 270

Val Asn Ser Val Leu His Ala Ile Glu Asn Asp Gly Asn Phe Asn Glu
 275 280 285

Ser Tyr Phe Leu Tyr Ser Asn Lys Thr Leu Ser Asn Lys Asp Val Phe
 290 295 300

Asp Ala Ile Ala Ile Ser Val Lys Lys Arg Ser Phe Ser Asp Gly Asp
 305 310 315 320

Ile Val Ile Lys Ser Asn Ser Glu Ala Gln Arg Asp Tyr Ala Leu Thr
 325 330 335

Ile Leu Gln Thr Ile Leu Ser Met Thr Pro Ile Phe Asp Ile Val Val
 340 345 350

Pro Glu Val Ser Val Pro Leu Gly Leu Gly Ile Ile Thr Ser Ser Met
 355 360 365

Gly Ile Ser Phe Asp Gln Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
 370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Ala Val Leu Leu Gly Leu
 385 390 395 400

Ser Phe Ala Ile Pro Leu Leu Ile Ser Lys Ala Gly Ile Asn Gln Glu
 405 410 415

Val Leu Ser Ser Val Ile Asn Asn Glu Gly Arg Thr Leu Asn Glu Thr
 420 425 430

Asn Ile Asp Ile Phe Leu Lys Glu Tyr Gly Ile Ala Glu Asp Ser Ile
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 Ser Ser Thr Asn Leu Leu Asp Val Lys Leu Lys Ser Ser Gly Gln His
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 Val Asn Ile Val Lys Leu Ser Asp Glu Asp Asn Gln Ile Val Ala Val
 465 470 475 480
 Lys Gly Ser Ser Leu Ser Gly Ile Tyr Tyr Glu Val Asp Ile Glu Thr
 485 490 495
 Gly Tyr Glu Ile Leu Ser Arg Arg Ile Tyr Arg Thr Glu Tyr Asn Asn
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 Glu Ile Leu Trp Thr Arg Gly Gly Leu Lys Gly Gly Gln Pro Phe
 515 520 525
 Asp Phe Glu Ser Leu Asn Ile Pro Val Phe Phe Lys Asp Glu Pro Tyr
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 Ser Ala Val Thr Gly Ser Pro Leu Ser Phe Ile Asn Asp Asp Ser Ser
 545 550 555 560
 Leu Leu Tyr Pro Asp Thr Asn Pro Lys Leu Pro Gln Pro Thr Ser Glu
 565 570 575
 Met Asp Ile Val Asn Tyr Val Lys Gly Ser Gly Ser Phe Gly Asp Arg
 580 585 590
 Phe Val Thr Leu Met Arg Gly Ala Thr Glu Glu Ala Trp Asn Ile
 595 600 605
 Ala Ser Tyr His Thr Ala Gly Gly Ser Thr Glu Glu Leu His Glu Ile
 610 615 620
 Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr
 625 630 635 640
 Ser Asn Val Asn Ser Ala Asp Ala Ala Ser Arg Arg His Phe Leu Val
 645 650 655
 Val Ile Lys Val His Val Lys Tyr Ile Thr Asn Asn Val Ser Tyr
 660 665 670
 Val Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu Ala
 675 680 685
 Val Val Asp Arg Arg Phe Asn Phe Pro Glu Pro Ser Thr Pro Pro Asp
 690 695 700
 Ile Ser Thr Ile Arg Lys Leu Leu Ser Leu Arg Tyr Phe Lys Glu Ser
 705 710 715 720
 Ile Glu Ser Thr Ser Lys Ser Asn Phe Gln Lys Leu Ser Arg Gly Asn
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Ile Asp Val Leu Lys Gly Arg Gly Ser Ile Ser Ser Thr Arg Gln Arg
 740 745 750

Ala Ile Tyr Pro Tyr Phe Glu Ala Ala Asn Ala Asp Glu Gln Gln Pro
 755 760 765

Leu Phe Phe Tyr Ile Lys Lys Asp Arg Phe Asp Asn His Gly Tyr Asp
 770 775 780

Gln Tyr Phe Tyr Asp Asn Thr Val Gly Leu Asn Gly Ile Pro Thr Leu
 785 790 795 800

Asn Thr Tyr Thr Gly Glu Ile Pro Ser Asp Ser Ser Ser Leu Gly Ser
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Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg
 820 825 830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
 835 840 845

Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser
 850 855 860

Gly Cys Thr Thr Ile Val Ala Arg Lys Glu Gly Tyr Ile Tyr Lys Val
 865 870 875 880

His Thr Gly Thr Thr Lys Ser Leu Ala Gly Phe Thr Ser Thr Thr Gly
 885 890 895

Val Lys Lys Ala Val Glu Val Leu Glu Leu Leu Thr Lys Glu Pro Ile
 900 905 910

Pro Arg Val Glu Gly Ile Met Ser Asn Asp Phe Leu Val Asp Tyr Leu
 915 920 925

Ser Glu Asn Phe Glu Asp Ser Leu Ile Thr Tyr Ser Ser Ser Glu Lys
 930 935 940

Lys Pro Asp Ser Gln Ile Thr Ile Ile Arg Asp Asn Val Ser Val Phe
 945 950 955 960

Pro Tyr Phe Leu Asp Asn Ile Pro Glu His Gly Phe Gly Thr Ser Ala
 965 970 975

Thr Val Leu Val Arg Val Asp Gly Asn Val Val Val Arg Ser Leu Ser
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Glu Ser Tyr Ser Leu Asn Ala Asp Ala Ser Glu Ile Ser Val Leu Lys
 995 1000 1005

Val Phe Ser Lys Lys Phe
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<211> 1014

<212> PRT

<213> Escherichia coli

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Arg Cys Phe Lys Thr Asp Leu Pro Trp Phe Ser Gln Val Asp Pro Asp
35 40 45

Asn Thr Tyr Phe Ile Arg Phe Ser Gln Ser Arg Ser Asn Ser Arg Ser
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Gly Val Leu Thr
65 70 75 80

Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr His Phe Asp Val Phe
85 90 95

Asp Asp Ala Asn Ala Ser Ala Gly Ile Tyr Lys Thr Ser Ser Ala Asp
100 105 110

Met Phe Asn Glu Lys Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu
115 120 125

Tyr Phe Leu Lys Gly Cys Asp Phe Ser Gly Ile Tyr Gly Arg Phe Leu
130 135 140

Ser Asp Tyr Trp Ser Lys Tyr Tyr Asp Lys Phe Lys Leu Leu Leu Lys
145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Leu Tyr Leu Tyr Lys Asn Gly Glu Ile
165 170 175

Asp Glu Tyr Glu Tyr Asn Phe Ser Ile Ser Ala Leu Asn Arg Arg Asp
180 185 190

Asn Ile Ser Leu Phe Phe Asp Ile Tyr Gly Tyr Tyr Ser Ser Asp
195 200 205

Met Phe Val Ala Lys Asn Asn Glu Arg Val Met Leu Phe Ile Pro Gly
210 215 220

Ala Lys Lys Pro Phe Leu Phe Glu Lys Asn Ile Ala Asp Leu Arg Ile
225 230 235 240

Ser Leu Lys Asn Leu Ile Lys Glu Asn Asp Asn Lys Gln Leu Leu Ser
245 250 255

Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Ile Thr Tyr Ala Gly
260 265 270

Val Asn Ser Val Leu Asn Ala Ile Glu Asn Asp Gly Val Phe Asn Glu
 275 280 285

Ser Tyr Phe Leu Tyr Ser Asn Lys Arg Ile Asn Asn Lys Asp Val Phe
 290 295 300

Asp Ala Val Ala Phe Ser Val Lys Lys Arg Ser Phe Ser Asp Gly Asp
 305 310 315 320

Ile Val Ile Lys Ser Asn Ser Glu Ala Gln Arg Asp Tyr Ala Leu Thr
 325 330 335

Ile Leu Gln Thr Ile Leu Ser Met Thr Pro Ile Phe Asp Val Ala Ile
 340 345 350

Pro Glu Val Ser Val Thr Leu Gly Leu Gly Ile Ile Ala Ser Ser Met
 355 360 365

Gly Ile Ser Phe Asp Gln Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
 370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Ala Ala Leu Leu Gly Leu
 385 390 395 400

Ser Phe Ala Ile Pro Phe Leu Ile Ser Lys Ala Gly Thr Asn Gln Lys
 405 410 415

Ile Leu Ser Arg Tyr Thr Lys His Glu Ile Arg Thr Leu Asn Glu Thr
 420 425 430

Asn Ile Asp Met Phe Leu Glu Glu Tyr Gly Ile Asn Lys Asn Ser Ile
 435 440 445

Ser Glu Thr Lys Val Leu Glu Val Glu Leu Lys Gly Ser Gly Gln His
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Val Asn Ile Val Lys Leu Ser Asp Glu Asp Asn Lys Ile Val Ala Val
 465 470 475 480

Lys Gly Asn Ser Leu Ser Gly Ile Tyr Tyr Glu Val Asp Ile Glu Thr
 485 490 495

Gly Tyr Glu Ile Ser Ser Arg Arg Ile Tyr Arg Thr Glu Tyr Asn Asp
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Lys Ile Phe Trp Thr Arg Gly Gly Leu Lys Gly Gly Gln Ser Phe
 515 520 525

Asp Phe Glu Ser Leu Lys Leu Pro Ile Phe Phe Lys Asp Glu Pro Tyr
 530 535 540

Ser Ala Val Pro Gly Ser Ser Leu Ser Phe Ile Asn Asp Asp Ser Ser
 545 550 555 560

Leu Leu Tyr Pro Asn Ser Thr Pro Lys Leu Pro Gln Pro Thr Pro Glu
 565 570 575

Met Glu Ile Val Asn Tyr Val Lys Arg Ala Gly Asn Phe Gly Glu Arg
 580 585 590

 Leu Val Thr Leu Met Arg Gly Thr Thr Glu Glu Glu Ala Trp Asn Ile
 595 600 605

 Ala Arg Tyr His Thr Ala Gly Gly Ser Thr Glu Glu Leu His Glu Ile
 610 615 620

 Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr
 625 630 635 640

 Ser Asn Ile Asn Ser Ala Asp Ala Ala Ser Arg Arg His Phe Leu Val
 645 650 655

 Val Ile Lys Val Gln Val Lys Tyr Ile Asn Asn Asn Asn Val Ser His
 660 665 670

 Val Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu Ala
 675 680 685

 Val Val Asp Arg Arg Phe Asn Phe Pro Glu Pro Ser Thr Pro Pro Asn
 690 695 700

 Ile Ser Ile Ile His Lys Leu Leu Ser Leu Arg Tyr Phe Lys Glu Asn
 705 710 715 720

 Ile Glu Ser Thr Ser Arg Leu Asn Leu Gln Lys Leu Asn Arg Gly Asn
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 Ile Asp Ile Phe Lys Gly Arg Gly Ser Ile Ser Ser Thr Arg Gln Arg
 740 745 750

 Ala Ile Tyr Pro Tyr Phe Glu Ser Ala Asn Ala Asp Glu Gln Gln Pro
 755 760 765

 Val Phe Phe Tyr Ile Lys Lys Asn Arg Phe Asp Asp Phe Gly Tyr Asp
 770 775 780

 Gln Tyr Phe Tyr Asn Ser Thr Val Gly Leu Asn Gly Ile Pro Thr Leu
 785 790 795 800

 Asn Thr Tyr Thr Gly Glu Ile Leu Ser Asp Ala Ser Ser Leu Gly Ser
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 Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg
 820 825 830

 Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
 835 840 845

 Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser
 850 855 860

 Gly Cys Thr Thr Ile Val Ala Arg Lys Gly Gly Tyr Leu Tyr Lys Val
 865 870 875 880

His Thr Gly Thr Thr Ile Pro Leu Ala Gly Phe Thr Ser Thr Thr Gly
 885 890 895

Val Lys Lys Ala Val Glu Val Phe Glu Leu Leu Thr Asn Asn Pro Met
 900 905 910

Pro Arg Val Glu Gly Val Met Asn Asn Asp Phe Leu Val Asn Tyr Leu
 915 920 925

Ala Glu Ser Phe Asp Glu Ser Leu Ile Thr Tyr Ser Ser Ser Glu Gln
 930 935 940

Lys Ile Gly Ser Lys Ile Thr Ile Ser Arg Asp Asn Val Ser Thr Phe
 945 950 955 960

Pro Tyr Phe Leu Asp Asn Ile Pro Glu Lys Gly Phe Gly Thr Ser Val
 965 970 975

Thr Ile Leu Val Arg Val Asp Gly Asn Val Ile Val Lys Ser Leu Ser
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Glu Ser Tyr Ser Leu Asn Val Glu Asn Ser Asn Ile Ser Val Leu His
 995 1000 1005

Val Phe Ser Lys Asp Phe
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<210> 3

<211> 1014

<212> PRT

<213> Yersinia pseudotuberculosis

<400> 3

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His	Lys	Phe	Ser	Thr	Thr	Leu	Pro	Trp	Phe	Gly	Trp	Ala	Asp	Pro	Asp
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Asn	Leu	Tyr	Phe	Ile	Arg	Phe	Thr	Gln	Ser	Arg	Ser	Asn	Asn	Lys	Ser
50							55				60				

Tyr	Thr	Gly	Trp	Asp	His	Leu	Gly	Lys	Tyr	Ala	Ile	Glu	Thr	Leu	Thr
65					70				75			80			

Leu	Thr	Gln	Ala	Ala	Ile	Val	Asn	Ile	Gly	Ser	Arg	Phe	Asp	Ile	Phe
85									90			95			

Asp	Glu	Ala	Asn	Ser	Thr	Ala	Gly	Ile	Tyr	Lys	Thr	Asn	Asn	Ala	Asp
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Ser	Phe	Asp	Glu	Thr	Asn	Glu	Ala	Lys	Met	Leu	Pro	Ser	Glu	Tyr	Leu
115								120			125				

Tyr Phe Leu Arg Asp Cys Asp Phe Ser Asn Leu Tyr Asn Lys Ala Leu
 130 135 140

Ser Asp Tyr Trp Ala Glu Asn Tyr Glu Lys Phe Ser Thr Leu Leu Gln
 145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Tyr Tyr Leu Tyr Lys Asp Ser Ala Ile
 165 170 175

Ser Lys Asp Glu Tyr Glu Phe Ser Ile Asp Ala Ile Phe Asn Lys Lys
 180 185 190

Ser Lys Ile Leu Arg Tyr Tyr Phe Asp Val Tyr Gly Tyr Tyr Ser Ser
 195 200 205

Asp Met Phe Val Ala Met Asn Asp Asn Lys Thr Met Leu Phe Ile Pro
 210 215 220

Gly Ala Thr Asn Pro Phe Ile Phe Ala Asp Asn Ile Thr Asp Leu Arg
 225 230 235 240

Asp Lys Ile Lys Ala Leu Ile Ser Asp Lys Asn Thr Arg Glu Leu Phe
 245 250 255

Ser Lys His Phe Ser Leu Tyr Asp Arg Gln Asp Gly Asn Thr Tyr Leu
 260 265 270

Gly Val Asn Ser Met Leu Glu Gln Ile Val Ser Gly Val Val Asp Thr
 275 280 285

Asn Tyr Ile Met Tyr Ser Asn Lys Asn Ile Arg Glu Arg Asn Val Phe
 290 295 300

Gly Ser Met Ala Phe Ser Thr Arg Glu Arg Ser Phe Asn Asp Gly Asp
 305 310 315 320

Val Ile Ile Lys Ser Asn Ala Glu Val Gln Arg Asp Tyr Ala Leu Asn
 325 330 335

Val Leu Gln Thr Ile Leu Ser Leu Ser Pro Ile Phe Asp Ile Val Leu
 340 345 350

Pro Glu Val Ser Ile Pro Ile Ser Leu Gly Ile Thr Ala Ser Ser Val
 355 360 365

Gly Ile Ser Phe Asp Glu Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
 370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Thr Val Leu Leu Gly Ile
 385 390 395 400

Ser Phe Ala Ile Pro Phe Leu Ile Ser Lys Ala Glu Glu Asn Lys Leu
 405 410 415

Ile Ile Asn Asn Leu Val Gly Ser Asp Glu Asn Ile Leu Asn Lys Asn
 420 425 430

Asn Leu Gly Asp Phe Leu Glu Lys Tyr Asn Ile Ser Glu Ser Asp Ile
 435 440 445
 Pro Glu Asn Gly Ser Leu Val Ile Asn Leu Lys Asn Thr Asn Val Pro
 450 455 460
 Val Arg Leu Val Lys Leu Asn Asp Glu Glu Gly Glu Ile Val Ala Ile
 465 470 475 480
 Lys Gly Ser Thr Leu Ser Gly Ile Tyr Tyr Glu Val Asp Thr Glu Thr
 485 490 495
 Gly Tyr Glu Ile Leu Ser Arg Arg Val Phe Arg Thr Glu Tyr Asn Glu
 500 505 510
 Lys Ile Tyr Trp Thr Arg Gly Gly Leu Lys Gly Gly Gln Pro Phe
 515 520 525
 Asn Phe Glu Gly Leu Asp Ile Pro Val Tyr Phe Ile Asp Lys Pro Tyr
 530 535 540
 Ser Glu Leu Ala Ser Ser Val Glu Leu Ser Phe Val Asn Asp Asp Ser
 545 550 555 560
 Pro Leu Leu Phe Pro Glu Met Asp Ser Arg Leu Pro Lys Pro Thr Pro
 565 570 575
 Glu Leu Asp Ile Lys Tyr Tyr Ser Ser Asn Leu Ser Ser Phe Lys Glu
 580 585 590
 Asp Thr Val Ile Leu Met Arg Gly Thr Thr Glu Glu Ala Trp Asn
 595 600 605
 Ile Ala Asn Tyr Lys Thr Ala Gly Gly Ser Asn Lys Asp Leu Glu Glu
 610 615 620
 Asn Phe Ile Glu Ala Gly Pro Gln Phe Asn Leu Ser Phe Ser Glu Tyr
 625 630 635 640
 Thr Ser Ser Ile Asn Ser Ala Asp Thr Ala Ser Arg Lys His Phe Leu
 645 650 655
 Val Ile Ile Lys Val Gln Val Lys Tyr Ile Ser Asn Asp Asn Val Leu
 660 665 670
 Tyr Ala Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu
 675 680 685
 Ala Val Val Asp Arg Arg Phe Ile Phe Pro Glu Pro Pro Val Lys Pro
 690 695 700
 Lys Leu Ser Phe Ile Gln Lys Ile Ala Asn Arg Phe Leu Thr Glu Asn
 705 710 715 720
 Val Ala Glu Ile Ser Ser Ile Asn Phe Arg Arg Leu Asn Ser Gly Asn
 725 730 735

Ile Asn Val Leu Lys Gly Arg Gly Val Phe Ser Ser Arg Arg Leu Arg
 740 745 750

Glu Ile Tyr Leu Arg Phe Asp Ala Ala Asn Ala Asp Glu Leu Arg Pro
 755 760 765

Gly Asp Val Tyr Val Lys Lys Thr Lys Phe Asp Ser Met Gly Tyr Asp
 770 775 780

Ser His Phe Tyr Asn Glu Gly Ile Gly Ile Asn Gly Ala Pro Thr Leu
 785 790 795 800

Asn Thr Tyr Thr Gly Glu Tyr Val Ala Asp Ser Ser Ser Gln Gly Ala
 805 810 815

Thr Tyr Trp Leu Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Lys
 820 825 830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
 835 840 845

Glu Ile Glu Glu Asn Lys Pro Val Val Ile Thr Ser Gly Thr Leu Thr
 850 855 860

Gly Cys Thr Val Val Phe Ala Arg Lys Gly Glu Tyr Phe Tyr Ala Val
 865 870 875 880

His Thr Gly Asn Ser Glu Ser Leu Ile Gly Phe Thr Ser Thr Ser Gly
 885 890 895

Val Ala Lys Ala Ile Glu Val Leu Ser Ser Leu Ser Glu Leu Glu Val
 900 905 910

Pro Ala Leu Pro Asp Val Ile Asn Asn Asn Thr Leu Val Glu Tyr Leu
 915 920 925

Ser Asp Asn Phe Asp Ser Ala Leu Ile Ser Tyr Ser Ser Ser Ser Leu
 930 935 940

Lys Pro Asn Ser Met Ile Asn Ile Ser Arg Glu Asn Val Ser Thr Phe
 945 950 955 960

Ser Tyr Tyr Thr Asp Asp Ile Gln Leu Pro Ser Phe Gly Thr Ser Val
 965 970 975

Thr Ile Leu Val Arg Thr Asn Asp Asn Thr Val Val Arg Ser Leu Ser
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Glu Ser Tyr Thr Met Asn Ser Asn Ser Ser Lys Met Val Val Phe Asn
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Val Leu Gln Lys Asp Phe
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<210> 4
<211> 1451
<212> PRT

<213> *Bordetella pertussis*

<400> 4

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															30
				20				25							

Lys	Ala	Glu	Phe	Ala	Leu	Phe	Ser	Glu	Ala	Pro	Asn	Gly	Asp	Glu	Pro
															45
				35			40								

Ile	Gly	Gln	Asp	Ala	Arg	Thr	Trp	Phe	Tyr	Phe	Pro	Lys	Tyr	Arg	Pro
															60
				50			55								

Val	Ala	Val	Ser	Asn	Leu	Lys	Lys	Met	Gln	Val	Ala	Ile	Arg	Ala	Arg
															80
				65		70			75						

Leu	Glu	Pro	Glu	Ser	Leu	Ile	Leu	Gln	Trp	Leu	Ile	Ala	Leu	Asp	Val
															95
				85				90							

Tyr	Leu	Gly	Val	Leu	Ile	Ala	Ala	Leu	Ser	Arg	Thr	Val	Ile	Ser	Asp
															110
				100			105								

Leu	Val	Phe	Glu	Tyr	Val	Lys	Ala	Arg	Tyr	Glu	Ile	Tyr	Tyr	Leu	Leu
															125
				115			120								

Asn	Arg	Val	Pro	His	Pro	Leu	Ala	Thr	Ala	Tyr	Leu	Lys	Arg	Arg	Arg
															140
				130			135								

Gln	Arg	Pro	Val	Asp	Arg	Ser	Gly	Arg	Leu	Gly	Ser	Val	Phe	Glu	His
															160
				145		150			155						

Pro	Leu	Trp	Phe	Ala	Tyr	Asp	Glu	Leu	Ala	Gly	Thr	Val	Asp	Leu	Asp
															175
				165				170							

Ala	Asp	Ile	Tyr	Glu	Gln	Ala	Leu	Ala	Glu	Ser	Ile	Glu	Arg	Arg	Met
															190
				180			185								

Asp	Gly	Glu	Pro	Asp	Asp	Gly	Ser	Leu	Asp	Thr	Ala	Glu	His	Asp	Val
															205
				195			200								

Trp	Arg	Leu	Cys	Arg	Asp	Gly	Ile	Asn	Arg	Gly	Glu	Gln	Ala	Ile	Phe
															220
				210		215				220					

Gln	Ala	Ser	Gly	Pro	Tyr	Gly	Val	Val	Ala	Asp	Ala	Gly	Tyr	Met	Arg
															240
				225			230			235					

Thr	Val	Ala	Asp	Leu	Ala	Tyr	Ala	Asp	Ala	Leu	Ala	Asp	Cys	Leu	His
															255
				245			250								

Ala	Gln	Leu	Arg	Ile	Arg	Ala	Gln	Gly	Ser	Val	Asp	Ser	Pro	Gly	Asp
															270
				260			265								

Glu Met Pro Arg Lys Leu Asp Ala Trp Glu Ile Ala Lys Phe His Leu
 275 280 285

Ala Ala Thr Gln Gln Ala Arg Val Asp Leu Leu Glu Ala Ala Phe Ala
 290 295 300

Leu Asp Tyr Ala Ala Leu Arg Asp Val Arg Val Tyr Gly Asp Tyr Arg
 305 310 315 320

Asn Ala Leu Ala Leu Arg Phe Ile Lys Arg Glu Ala Leu Arg Leu Leu
 325 330 335

Gly Ala Arg Arg Gly Asn Ala Ser Thr Met Pro Ala Val Ala Ala Gly
 340 345 350

Glu Tyr Asp Glu Ile Val Ala Ser Gly Ala Ala Asn Asp Ala Ala Tyr
 355 360 365

Val Ser Met Ala Ala Ala Leu Ile Ala Gly Val Leu Cys Asp Leu Glu
 370 375 380

Ser Ala Gln Arg Thr Leu Pro Val Val Leu Ala Arg Phe Arg Pro Leu
 385 390 395 400

Gly Val Leu Ala Arg Phe Arg Arg Leu Glu Gln Glu Thr Ala Gly Met
 405 410 415

Leu Leu Gly Asp Gln Glu Pro Glu Pro Arg Gly Phe Ile Ser Phe Thr
 420 425 430

Asp Phe Arg Asp Ser Asp Ala Phe Ala Ser Tyr Ala Glu Tyr Ala Ala
 435 440 445

Gln Phe Asn Asp Tyr Ile Asp Gln Tyr Ser Ile Leu Glu Ala Gln Arg
 450 455 460

Leu Ala Arg Ile Leu Ala Leu Gly Ser Arg Met Thr Val Asp Gln Trp
 465 470 475 480

Cys Leu Pro Leu Gln Lys Val Arg His Tyr Lys Val Leu Thr Ser Gln
 485 490 495

Pro Gly Leu Ile Ala Arg Gly Ile Glu Asn His Asn Arg Gly Ile Glu
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Tyr Cys Leu Gly Arg Pro Pro Leu Thr Asp Leu Pro Gly Leu Phe Thr
 515 520 525

Met Phe Gln Leu His Asp Ser Ser Trp Leu Leu Val Ser Asn Ile Asn
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Gly Glu Leu Trp Ser Asp Val Leu Ala Asn Ala Glu Val Met Gln Asn
 545 550 555 560

Pro Thr Leu Ala Ala Leu Ala Glu Pro Gln Gly Arg Phe Arg Thr Gly
 565 570 575

Arg Arg Thr Gly Gly Trp Phe Leu Gly Gly Pro Ala Thr Glu Gly Pro
 580 585 590

Ser Leu Arg Asp Asn Tyr Leu Leu Lys Leu Arg Gln Ser Asn Pro Gly
 595 600 605

Leu Asp Val Lys Lys Cys Trp Tyr Phe Gly Tyr Arg Gln Glu Tyr Arg
 610 615 620

Leu Pro Ala Gly Ala Leu Gly Val Pro Leu Phe Ala Val Ser Val Ala
 625 630 635 640

Leu Arg His Ser Leu Asp Asp Leu Ala Ala His Ala Lys Ser Ala Leu
 645 650 655

Tyr Lys Pro Ser Glu Trp Gln Lys Phe Ala Phe Trp Ile Val Pro Phe
 660 665 670

Tyr Arg Glu Ile Phe Phe Ser Thr Gln Asp Arg Ser Tyr Arg Val Asp
 675 680 685

Val Gly Ser Ile Val Phe Asp Ser Ile Ser Leu Leu Ala Ser Val Phe
 690 695 700

Ser Ile Gly Gly Lys Leu Gly Ser Phe Thr Arg Thr Gln Tyr Gly Asn
 705 710 715 720

Leu Arg Asn Phe Val Val Arg Gln Arg Ile Ala Gly Leu Ser Gly Gln
 725 730 735

Arg Leu Trp Arg Ser Val Leu Lys Glu Leu Pro Ala Leu Ile Gly Ala
 740 745 750

Ser Gly Leu Arg Leu Ser Arg Ser Leu Leu Val Asp Leu Tyr Glu Ile
 755 760 765

Phe Glu Pro Val Pro Ile Arg Arg Leu Val Ala Gly Phe Val Ser Ala
 770 775 780

Thr Thr Val Gly Gly Arg Asn Gln Ala Phe Leu Arg Gln Ala Phe Ser
 785 790 795 800

Ala Ala Ser Ser Ser Ala Gly Arg Thr Gly Gly Gln Leu Ala Ser Glu
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Trp Arg Met Ala Gly Val Asp Ala Thr Gly Leu Val Glu Ser Thr Ser
 820 825 830

Gly Gly Arg Phe Glu Gly Ile Tyr Thr Arg Gly Leu Gly Pro Leu Ser
 835 840 845

Glu Cys Thr Glu His Phe Ile Val Glu Ser Gly Asn Ala Tyr Arg Val
 850 855 860

Ile Trp Asp Ala Tyr Thr His Gly Trp Arg Val Val Asn Gly Arg Leu
 865 870 875 880

Pro Pro Arg Leu Thr Tyr Thr Val Pro Val Arg Leu Asn Gly Gln Gly
 885 890 895

His Trp Glu Thr His Leu Asp Val Pro Gly Arg Gly Gly Ala Pro Glu
 900 905 910

Ile Phe Gly Arg Ile Arg Thr Arg Asn Leu Val Ala Leu Ala Ala Glu
 915 920 925

Gln Ala Ala Pro Met Arg Arg Leu Leu Asn Gln Ala Arg Arg Val Ala
 930 935 940

Leu Arg His Ile Asp Thr Cys Arg Ser Arg Leu Ala Leu Pro Arg Ala
 945 950 955 960

Glu Ser Asp Met Asp Ala Ala Ile Arg Ile Phe Phe Gly Glu Pro Asp
 965 970 975

Ala Gly Leu Arg Gln Arg Ile Gly Arg Arg Leu Gln Glu Val Arg Ala
 980 985 990

Tyr Ile Gly Asp Leu Ser Pro Val Asn Asp Val Leu Tyr Arg Ala Gly
 995 1000 1005

Tyr Asp Leu Asp Asp Val Ala Thr Leu Phe Asn Ala Val Asp Arg Asn
 1010 1015 1020

Thr Ser Leu Gly Arg Gln Ala Arg Met Glu Leu Tyr Leu Asp Ala Ile
 1025 1030 1035 1040

Val Asp Leu His Ala Arg Leu Gly Tyr Glu Asn Ala Arg Phe Val Asp
 1045 1050 1055

Leu Met Ala Phe His Leu Leu Ser Leu Gly His Ala Ala Thr Ala Ser
 1060 1065 1070

Glu Val Val Glu Ala Val Ser Pro Arg Leu Leu Gly Asn Val Phe Asp
 1075 1080 1085

Ile Ser Asn Val Ala Gln Leu Glu Arg Gly Ile Gly Asn Pro Ala Ser
 1090 1095 1100

Thr Gly Leu Phe Val Met Leu Gly Ala Tyr Ser Glu Ser Ser Pro Ala
 1105 1110 1115 1120

Ile Phe Gln Ser Phe Val Asn Asp Ile Phe Pro Ala Trp Arg Gln Ala
 1125 1130 1135

Ser Gly Gly Pro Leu Val Trp Asn Phe Gly Pro Ala Ala Ile Ser
 1140 1145 1150

Pro Thr Arg Leu Asp Tyr Ala Asn Thr Asp Ile Gly Leu Leu Asn His
 1155 1160 1165

Gly Asp Ile Ser Pro Leu Arg Ala Arg Pro Pro Leu Gly Gly Arg Arg
 1170 1175 1180

Asp Ile Asp Leu Pro Pro Gly Leu Asp Ile Ser Phe Val Arg Tyr Asp
 1185 1190 1195 1200
 Arg Pro Val Arg Met Ser Ala Pro Arg Ala Leu Asp Ala Ser Val Phe
 1205 1210 1215
 Arg Pro Val Asp Gly Pro Val His Gly Tyr Ile Gln Ser Trp Thr Gly
 1220 1225 1230
 Ala Glu Ile Glu Tyr Ala Tyr Gly Ala Pro Ala Ala Arg Glu Val
 1235 1240 1245
 Met Leu Thr Asp Asn Val Arg Ile Ile Ser Ile Glu Asn Gly Asp Glu
 1250 1255 1260
 Gly Ala Ile Gly Val Arg Val Arg Leu Asp Thr Val Pro Val Ala Thr
 1265 1270 1275 1280
 Pro Leu Ile Leu Thr Gly Gly Ser Leu Ser Gly Cys Thr Thr Met Val
 1285 1290 1295
 Gly Val Lys Glu Gly Tyr Leu Ala Phe Tyr His Thr Gly Lys Ser Thr
 1300 1305 1310
 Glu Leu Gly Asp Trp Ala Thr Ala Arg Glu Gly Val Gln Ala Leu Tyr
 1315 1320 1325
 Gln Ala His Leu Ala Met Gly Tyr Ala Pro Ile Ser Ile Pro Ala Pro
 1330 1335 1340
 Met Arg Asn Asp Asp Leu Val Ser Ile Ala Ala Thr Tyr Asp Arg Ala
 1345 1350 1355 1360
 Val Ile Ala Tyr Leu Gly Lys Asp Val Pro Gly Gly Ser Thr Arg
 1365 1370 1375
 Ile Thr Arg His Asp Glu Gly Ala Gly Ser Val Val Ser Phe Asp Tyr
 1380 1385 1390
 Asn Ala Ala Val Gln Ala Ser Ala Val Pro Arg Leu Gly Gln Val Tyr
 1395 1400 1405
 Val Leu Ile Ser Asn Asp Gly Gln Gly Ala Arg Ala Val Leu Leu Ala
 1410 1415 1420
 Glu Asp Leu Ala Trp Ala Gly Ser Gly Ser Ala Leu Asp Val Leu Asn
 1425 1430 1435 1440
 Glu Arg Leu Val Thr Leu Phe Pro Ala Pro Val
 1445 1450

<210> 5
 <211> 240
 <212> PRT
 <213> Salmonella typhimurium

<400> 5
 Met Thr Lys Ile Thr Leu Ser Pro Gln Asn Phe Arg Ile Gln Lys Gln
 1 5 10 15

Glu Thr Thr Leu Leu Lys Glu Lys Ser Thr Glu Lys Asn Ser Leu Ala
 20 25 30

Lys Ser Ile Leu Ala Val Lys Asn His Phe Ile Glu Leu Arg Ser Lys
 35 40 45

Leu Ser Glu Arg Phe Ile Ser His Lys Asn Thr Glu Ser Ser Ala Thr
 50 55 60

His Phe His Arg Gly Ser Ala Ser Glu Gly Arg Ala Val Leu Thr Asn
 65 70 75 80

Lys Val Val Lys Asp Phe Met Leu Gln Thr Leu Asn Asp Ile Asp Ile
 85 90 95

Arg Gly Ser Ala Ser Lys Asp Pro Ala Tyr Ala Ser Gln Thr Arg Glu
 100 105 110

Ala Ile Leu Ser Ala Val Tyr Ser Lys Asn Lys Asp Gln Cys Cys Asn
 115 120 125

Leu Leu Ile Ser Lys Gly Ile Asn Ile Ala Pro Phe Leu Gln Glu Ile
 130 135 140

Gly Glu Ala Ala Lys Asn Ala Gly Leu Pro Gly Thr Thr Lys Asn Asp
 145 150 155 160

Val Phe Thr Pro Ser Gly Ala Gly Ala Asn Pro Phe Ile Thr Pro Leu
 165 170 175

Ile Ser Ser Ala Asn Ser Lys Tyr Pro Arg Met Phe Ile Asn Gln His
 180 185 190

Gln Gln Ala Ser Phe Lys Ile Tyr Ala Glu Lys Ile Ile Met Thr Glu
 195 200 205

Val Ala Pro Leu Phe Asn Glu Cys Ala Met Pro Thr Pro Gln Gln Phe
 210 215 220

Gln Leu Ile Leu Glu Asn Ile Ala Asn Lys Tyr Ile Gln Tyr Thr Pro
 225 230 235 240

<210> 6
<211> 240
<212> PRT
<213> *Salmonella typhimurium*

<400> 6
 Met Thr Asn Ile Thr Leu Ser Thr Gln His Tyr Arg Ile His Arg Ser
 1 5 10 15

Asp Val Glu Pro Val Lys Glu Lys Thr Thr Glu Lys Asp Ile Phe Ala
 20 25 30

Lys Ser Ile Thr Ala Val Arg Asn Ser Phe Ile Ser Leu Ser Thr Ser
 35 40 45

 Leu Ser Asp Arg Phe Ser Leu His Gln Gln Thr Asp Ile Pro Thr Thr
 50 55 60

 His Phe His Arg Gly Asn Ala Ser Glu Gly Arg Ala Val Leu Thr Ser
 65 70 75 80

 Lys Thr Val Lys Asp Phe Met Leu Gln Lys Leu Asn Ser Leu Asp Ile
 85 90 95

 Lys Gly Asn Ala Ser Lys Asp Pro Ala Tyr Ala Arg Gln Thr Cys Glu
 100 105 110

 Ala Ile Leu Ser Ala Val Tyr Ser Asn Asn Lys Asp Gln Cys Cys Lys
 115 120 125

 Leu Leu Ile Ser Lys Gly Val Ser Ile Thr Pro Phe Leu Lys Glu Ile
 130 135 140

 Gly Glu Ala Ala Gln Asn Ala Gly Leu Pro Gly Glu Ile Lys Asn Gly
 145 150 155 160

 Val Phe Thr Pro Gly Gly Ala Gly Ala Asn Pro Phe Val Val Pro Leu
 165 170 175

 Ile Ala Ser Ala Ser Ile Lys Tyr Pro His Met Phe Ile Asn His Asn
 180 185 190

 Gln Gln Val Ser Phe Lys Ala Tyr Ala Glu Lys Ile Val Met Lys Glu
 195 200 205

 Val Thr Pro Leu Phe Asn Lys Gly Thr Met Pro Thr Pro Gln Gln Phe
 210 215 220

 Gln Leu Thr Ile Glu Asn Ile Ala Asn Lys Tyr Leu Gln Asn Ala Ser
 225 230 235 240

 <210> 7
 <211> 166
 <212> PRT
 <213> Shigella flexneri

 <400> 7
 Met Glu Ile Gln Asn Thr Lys Ser Ala Pro Ile Leu Tyr Thr Asp Ile
 1 5 10 15

 Ser Thr Lys Gln Thr Gln Ser Ser Ser Glu Thr Gln Lys Ser Gln Asn
 20 25 30

 Tyr Gln Gln Leu Ala Ala His Ile Pro Leu Asn Val Gly Lys Asn Pro
 35 40 45

 Val Leu Thr Thr Thr Leu Asn Asp Asp Gln Leu Leu Lys Leu Ser Glu
 50 55 60

Gln Val Gln His Asp Ser Glu Ile Ile Ala Arg Leu Thr Asp Lys Lys
 65 70 75 80

 Met Lys Asp Leu Ser Glu Met Ser His Thr Ile Thr Pro Glu Asn Thr
 85 90 95

 Leu Asp Ile Ser Ser Leu Ser Ser Asn Ala Val Ser Leu Ile Ile Ser
 100 105 110

 Val Ala Val Leu Leu Ser Ala Leu Arg Thr Ala Glu Thr Arg Leu Gly
 115 120 125

 Ser Gln Leu Ser Leu Ile Ala Phe Asp Ala Thr Lys Ser Ala Ala Glu
 130 135 140

 Asn Ile Val Arg Gln Gly Leu Ala Ala Leu Ser Ser Ser Ile Thr Gly
 145 150 155 160

 Ala Val Thr Gln Val Gly
 165

<210> 8
 <211> 1186
 <212> PRT
 <213> Helicobacter pylori

<400> 8
 Met Thr Asn Glu Thr Ile Asp Gln Thr Arg Thr Pro Asp Gln Thr Gln
 1 5 10 15

 Ser Gln Thr Ala Phe Asp Pro Gln Gln Phe Ile Asn Asn Leu Gln Val
 20 25 30

 Ala Phe Ile Lys Val Asp Asn Val Val Ala Ser Phe Asp Pro Asp Gln
 35 40 45

 Lys Pro Ile Val Asp Lys Asn Asp Arg Asp Asn Arg Gln Ala Phe Asp
 50 55 60

 Gly Ile Ser Gln Leu Arg Glu Glu Tyr Ser Asn Lys Ala Ile Lys Asn
 65 70 75 80

 Pro Thr Lys Lys Asn Gln Tyr Phe Ser Asp Phe Ile Asp Lys Ser Asn
 85 90 95

 Asp Leu Ile Asn Lys Asp Asn Leu Ile Asp Val Glu Ser Ser Thr Lys
 100 105 110

 Ser Phe Gln Lys Phe Gly Asp Gln Arg Tyr Gln Ile Phe Thr Ser Trp
 115 120 125

 Val Ser His Gln Lys Asp Pro Ser Lys Ile Asn Thr Arg Ser Ile Arg
 130 135 140

 Asn Phe Met Glu Asn Ile Ile Gln Pro Pro Ile Pro Asp Asp Lys Glu
 145 150 155 160

Lys Ala Glu Phe Leu Lys Ser Ala Lys Gln Ser Phe Ala Gly Ile Ile
 165 170 175
 Ile Gly Asn Gln Ile Arg Thr Asp Gln Lys Phe Met Gly Val Phe Asp
 180 185 190
 Glu Ser Leu Lys Glu Arg Gln Glu Ala Glu Lys Asn Gly Gly Pro Thr
 195 200 205
 Gly Gly Asp Trp Leu Asp Ile Phe Leu Ser Phe Ile Phe Asn Lys Lys
 210 215 220
 Gln Ser Ser Asp Val Lys Glu Ala Ile Asn Gln Glu Pro Val Pro His
 225 230 235 240
 Val Gln Pro Asp Ile Ala Thr Thr Thr Asp Ile Gln Gly Leu Pro
 245 250 255
 Pro Glu Ala Arg Asp Leu Leu Asp Glu Arg Gly Asn Phe Ser Lys Phe
 260 265 270
 Thr Leu Gly Asp Met Glu Met Leu Asp Val Glu Gly Val Ala Asp Ile
 275 280 285
 Asp Pro Asn Tyr Lys Phe Asn Gln Leu Ile His Asn Asn Ala Leu
 290 295 300
 Ser Ser Val Leu Met Gly Ser His Asn Gly Ile Glu Pro Glu Lys Val
 305 310 315 320
 Ser Leu Leu Tyr Ala Gly Asn Gly Phe Gly Asp Lys His Asp Trp
 325 330 335
 Asn Ala Thr Val Gly Tyr Lys Asp Gln Gln Gly Asn Asn Val Ala Thr
 340 345 350
 Leu Ile Asn Val His Met Lys Asn Gly Ser Gly Leu Val Ile Ala Gly
 355 360 365
 Gly Glu Lys Gly Ile Asn Asn Pro Ser Phe Tyr Leu Tyr Lys Glu Asp
 370 375 380
 Gln Leu Thr Gly Ser Gln Arg Ala Leu Ser Gln Glu Glu Ile Arg Asn
 385 390 395 400
 Lys Val Asp Phe Met Glu Phe Leu Ala Gln Asn Asn Thr Lys Leu Asp
 405 410 415
 Asn Leu Ser Glu Lys Glu Lys Phe Gln Asn Glu Ile Glu Asp
 420 425 430
 Phe Gln Lys Asp Ser Lys Ala Tyr Leu Asp Ala Leu Gly Asn Asp Arg
 435 440 445
 Ile Ala Phe Val Ser Lys Lys Asp Thr Lys His Ser Ala Leu Ile Thr
 450 455 460

Glu Phe Asn Asn Gly Asp Leu Ser Tyr Thr Leu Lys Asp Tyr Gly Lys
 465 470 475 480

 Lys Ala Asp Lys Ala Leu Asp Arg Glu Lys Asn Val Thr Leu Gln Gly
 485 490 495

 Ser Leu Lys His Asp Gly Val Met Phe Val Asp Tyr Ser Asn Phe Lys
 500 505 510

 Tyr Thr Asn Ala Ser Lys Asn Pro Asn Lys Gly Val Gly Ala Thr Asn
 515 520 525

 Gly Val Ser His Leu Glu Ala Gly Phe Asn Lys Val Ala Val Phe Asn
 530 535 540

 Leu Pro Asp Leu Asn Asn Leu Ala Ile Thr Ser Phe Val Arg Arg Asn
 545 550 555 560

 Leu Glu Asn Lys Leu Thr Ala Lys Gly Leu Ser Leu Gln Glu Ala Asn
 565 570 575

 Lys Leu Ile Lys Asp Phe Leu Ser Ser Asn Lys Glu Leu Ala Gly Lys
 580 585 590

 Ala Leu Asn Phe Asn Lys Ala Val Ala Glu Ala Lys Ser Thr Gly Asn
 595 600 605

 Tyr Asp Glu Val Lys Lys Ala Gln Lys Asp Leu Glu Lys Ser Leu Arg
 610 615 620

 Lys Arg Glu His Leu Glu Lys Glu Val Glu Lys Lys Leu Glu Ser Lys
 625 630 635 640

 Ser Gly Asn Lys Asn Lys Met Glu Ala Lys Ala Gln Ala Asn Ser Gln
 645 650 655

 Lys Asp Glu Ile Phe Ala Leu Ile Asn Lys Glu Ala Asn Arg Asp Ala
 660 665 670

 Arg Ala Ile Ala Tyr Thr Gln Asn Leu Lys Gly Ile Lys Arg Glu Leu
 675 680 685

 Ser Asp Lys Leu Glu Lys Ile Ser Lys Asp Leu Lys Asp Phe Ser Lys
 690 695 700

 Ser Phe Asp Glu Phe Lys Asn Gly Lys Asn Lys Asp Phe Ser Lys Ala
 705 710 715 720

 Glu Glu Thr Leu Lys Ala Leu Lys Gly Ser Val Lys Asp Leu Gly Ile
 725 730 735

 Asn Pro Glu Trp Ile Ser Lys Val Glu Asn Leu Asn Ala Ala Leu Asn
 740 745 750

 Glu Phe Lys Asn Gly Lys Asn Lys Asp Phe Ser Lys Val Thr Gln Ala
 755 760 765

Lys Ser Asp Leu Glu Asn Ser Val Lys Asp Val Ile Ile Asn Gln Lys
 770 775 780

Val Thr Asp Lys Val Asp Asn Leu Asn Gln Ala Val Ser Val Ala Lys
 785 790 795 800

Ala Met Gly Asp Phe Ser Arg Val Glu Gln Val Leu Ala Asp Leu Lys
 805 810 815

Asn Phe Ser Lys Glu Gln Leu Ala Gln Gln Ala Gln Lys Asn Glu Asp
 820 825 830

Phe Asn Thr Gly Lys Asn Ser Glu Leu Tyr Gln Ser Val Lys Asn Ser
 835 840 845

Val Asn Lys Thr Leu Val Gly Asn Gly Leu Ser Gly Ile Glu Ala Thr
 850 855 860

Ala Leu Ala Lys Asn Phe Ser Asp Ile Lys Lys Glu Leu Asn Glu Lys
 865 870 875 880

Phe Lys Asn Phe Asn Asn Asn Asn Gly Leu Lys Asn Ser Thr Glu
 885 890 895

Pro Ile Tyr Ala Lys Val Asn Lys Lys Thr Gly Gln Val Ala Ser
 900 905 910

Pro Glu Glu Pro Ile Tyr Thr Gln Val Ala Lys Lys Val Asn Ala Lys
 915 920 925

Ile Asp Arg Leu Asn Gln Ile Ala Ser Gly Leu Gly Gly Val Gly Gln
 930 935 940

Ala Ala Gly Phe Pro Leu Lys Arg His Asp Lys Val Asp Asp Leu Ser
 945 950 955 960

Lys Val Gly Leu Ser Ala Ser Pro Glu Pro Ile Tyr Ala Thr Ile Asp
 965 970 975

Asp Leu Gly Gly Pro Phe Pro Leu Lys Arg His Asp Lys Val Asp Asp
 980 985 990

Leu Ser Lys Val Gly Arg Ser Arg Asn Gln Glu Leu Ala Gln Lys Ile
 995 1000 1005

Asp Asn Leu Asn Gln Ala Val Ser Glu Ala Lys Ala Gly Phe Phe Gly
 1010 1015 1020

Asn Leu Glu Gln Thr Ile Asp Lys Leu Lys Asp Ser Thr Lys Lys Asn
 1025 1030 1035 1040

Val Met Asn Leu Tyr Val Glu Ser Ala Lys Lys Val Pro Ala Ser Leu
 1045 1050 1055

Ser Ala Lys Leu Asp Asn Tyr Ala Ile Asn Ser His Thr Arg Ile Asn
 1060 1065 1070

Ser Asn Ile Gln Asn Gly Ala Ile Asn Glu Lys Ala Thr Gly Met Leu
 1075 1080 1085
 Thr Gln Lys Asn Pro Glu Trp Leu Lys Leu Val Asn Asp Lys Ile Val
 1090 1095 1100
 Ala His Asn Val Gly Ser Val Ser Leu Ser Glu Tyr Asp Lys Ile Gly
 1105 1110 1115 1120
 Phe Asn Gln Lys Asn Met Lys Asp Tyr Ser Asp Ser Phe Lys Phe Ser
 1125 1130 1135
 Thr Lys Leu Asn Asn Ala Val Lys Asp Ile Lys Ser Gly Phe Thr His
 1140 1145 1150
 Phe Leu Ala Asn Ala Phe Ser Thr Gly Tyr Tyr Cys Leu Ala Arg Glu
 1155 1160 1165
 Asn Ala Glu His Gly Ile Lys Asn Val Asn Thr Lys Gly Gly Phe Gln
 1170 1175 1180
 Lys Ser
 1185

<210> 9
 <211> 201
 <212> PRT
 <213> Homo sapiens

<400> 9
 Ser Ser Gly Pro Ser Ser Ser Leu Asp Asn Ser Leu Asp Val
 1 5 10 15
 Leu Lys Asn His Val Leu Asn Glu Leu Ile Gln Thr Glu Arg Val Tyr
 20 25 30
 Val Arg Glu Leu Tyr Thr Val Leu Leu Gly Tyr Arg Ala Glu Met Asp
 35 40 45
 Asn Pro Glu Met Phe Asp Leu Met Pro Pro Leu Leu Arg Asn Lys Lys
 50 55 60
 Asp Ile Leu Phe Gly Asn Met Ala Glu Ile Tyr Glu Phe His Asn Asp
 65 70 75 80
 Ile Phe Leu Ser Ser Leu Glu Asn Cys Ala His Ala Pro Glu Arg Val
 85 90 95
 Gly Pro Cys Phe Leu Glu Arg Lys Asp Asp Phe Gln Met Tyr Ala Lys
 100 105 110
 Tyr Cys Gln Asn Lys Pro Arg Ser Glu Thr Ile Trp Arg Lys Tyr Ser
 115 120 125
 Glu Cys Ala Phe Phe Gln Glu Cys Gln Arg Lys Leu Lys His Arg Leu
 130 135 140

Arg Leu Asp Ser Tyr Leu Leu Lys Pro Val Gln Arg Ile Thr Lys Tyr
145 150 155 160

Gln Leu Leu Leu Lys Glu Leu Leu Lys Tyr Ser Lys Asp Cys Glu Gly
165 170 175

Ser Ala Leu Leu Lys Lys Ala Leu Asp Ala Met Leu Asp Leu Leu Lys
180 185 190

Ser Val Asn Asp Ser Met His Gln Ile
195 200